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EDUCATION AS A SUBJECT OF THE UKRAINIAN LABOR MARKET DURING MARTIAL LAW

Abstract. An urgent issue is to conduct systematic studies of the education role in the Ukrainian labor market formation and functioning. The study's purpose is to identify the existing prerequisites and determine directions for the educational sector development as one of the Ukrainian labor market defining subjects. For this, several complex tasks of a comparative analysis of Ukraine's official statistical data in peace (2021) and war (2022) years are being solved. The general methodological orientation is to identify relative proportions, taking into account the martial law impact on the labor market and the statistical information reliability. Macroeconomic indicators of the Ukraine labor market are studied by the methods of structural and diversified intersectional comparison and statistical analysis of stochastic dependencies under uncertain conditions. Theoretical generalizations of changes in macroeconomic indicators and the interpretation for the future are based on the results of the structural-dynamic analysis. Under martial law, there was a reduction in supply and demand by almost 2 times against the backdrop of a significant increase in market imbalance. According to the results of the statistical data processing, the direction and form of education activation as a catalyst for the recovery and development of the economy of Ukraine are proposed. The initial direction in the current Ukraine labor market is to use the education potential to eliminate the jobs lacking. Providing knowledge to the unemployed to fill existing vacancies remains the education prerogative. The form of implementation of these directions is the diversification of education on the basis of public-private partnerships. The public-private institutional field appropriate adjustment in the form of training and qualification complexes (primarily in the vocational education area) is a step toward the public-private partnerships introduction in other economic sectors. Further research should be focused on finding ways to activate education as the labor market subject of forming quantitative and qualitative parameters. For example, in relation to the required and available qualifications of the unemployed, working conditions, and the level of remuneration.

Keywords: education, economy, employment, labor market, martial law, subject, Ukraine, unemployment.

JEL classification: I21, I25, J21.

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Introduction. The State Employment Service shows signs of the education special position among other

economic activity types. This active state intermediary between employers and job seekers provides training,

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retraining, and advanced training for the unemployed. This service provides social protection and financial support for the unemployed during the training process.

Establishing market regulation legislative principles is an important state function. But the undisputed state monopoly on providing educational qualifications is one of the reasons for the labor market disbalance. First, the fact that an unemployed person applies to the employment service means that the knowledge obtained in the existing education system does not meet market needs. Secondly, to eliminate this discrepancy, the same education system is used, but already as an auxiliary tool. Such an approach does not eliminate the labor market problems but only accumulates the need for dispatching accounting services and matching the unemployed qualifications with the requirements for vacancies. The reason for falling into this continuous circle is the attitude to education only as one of the economic activity types, which product should be qualifications approved by state institutions.

Research on the education economic content is an urgent issue for the relevant systemic changes initiation. Education's final product as an economic activity type is intellectual and labor capital: «In an unpredictable and changing world, it is important that education provides young people with knowledge and skills that meet labor-market and societal needs» [1, p. 81]. The discrepancy between the knowledge and skills acquired in the education system and the economic needs directly affects the national market disbalance as a whole. Vacant jobs mean unused production capacity

and an unemployed economically active population means unused human capital. In the general case, both the first and second are the result of the existing approach to training potential employers and employees.

Education affects not only the labor market's quantitative indicators but also the national economy's qualitative parameters as a whole. The workplace (vacancy) economic efficiency depends simultaneously on the education perfection of the employer and the employee. The educational sector specificity is that it simultaneously contains jobs for educators (as the labor market object) and provides the necessary knowledge to employers and employees for all other economic activity types (as the labor market subject). Solving economic issues requires the relevant knowledge use, and mastering, testing, and bringing this knowledge through the educational process to the practical use level – the corresponding economic costs. The complexity is added by the investment cycle length from investing in new research to the human capital creation through the educational process and obtaining economic results.

The education role study in solving labor market issues is a component of the general scientific investment and innovation issues of the economic development of the national macro-system [2]. In Ukrainian realities, such problem formulation is necessary for solving practical issues series. The priority is to adjust the educators' labor market to ensure the ability to overcome the current war state economic challenges. It is promising to have a vision of the educational process's role as a labor market subject, tuned to the post-war recovery of the economy.

Literature review. The full-scale war has significantly changed the supply and demand in the labor market of Ukraine. Mass emigration and the production facilities destruction caused a decrease in the labor resources supply and the demand for jobs. As a result of these changes, the unemployment rate increased to 35%, which is almost four times higher than in 2021 [3]. Conditions for recording labor market statistics and the analytical apparatus for its survey have become more complicated [4].

Studies by foreign scientists testify to the education influence on the labor market in general: «Educational attainment and employment rates are strongly correlated» [1, p. 64]. Foreign and domestic studies contain different views on education, but they are unanimous in understanding that education is an adjusting means for the economically active population to the labor market needs. These studies range from the education impact on wages [5] to reforming education to overcome unemployment [6].

Unemployment has a double negative effect on the national economy. Unused labor resources mean lost budget revenues and require corresponding social costs [7]. That is, the unemployment economic content is not limited to the person's livelihood lack «who turned to the employment center for the purpose of receiving employment assistance services» [8; 9]. The knowledge and skills correspondence acquired through the education system to the market needs is a condition for its balance and an entrepreneurial resource source [10]. The modern labor market requires attention to professional

orientation at all education levels [11; 12]. In the restoring issue of the market equilibrium state, special attention is paid to the vocational education advantages and disadvantages. It is considered as a means of overcoming unemployment by promoting the rapid entry into the labor market of young people and adults retraining [11, p. 9; 13, p. 83].

Researchers pay attention to the losses associated with the unemployed education level: «The societal costs of inactivity among individuals with tertiary attainment are especially high. Governments spend large sums to educate people to tertiary level» [1, p. 70]. The need to improve education to bring it closer to production needs is substantiated [14]. It is also about the fact that providing education with those skills that are necessary for the labor market should not depend on the economic climate. «Public investment in education can be a sensible way to counterbalance unemployment and invest in future economic growth, by building the necessary skills» [1, p. 48]. The growing number of youth not in employment, education, or training (NEET) indicates the distance between the research results on the mentioned issues and practical implementation. The authors note the essentially paradoxical situation that technical progress hinders employment, and therefore, the well-being of an entire generation [15, p. 14].

Domestic researchers note that in the war state, the labor market of Ukraine is characterized by a high level of uncertainty. The first main component – a spontaneous deviation from the usual course of events, is superimposed on its derivative – a violation of the receipt

order and information accounting: «Due to military operations in the current year (2022), the Ukraine State Statistics Service is unable to conduct relevant surveys (*according to the International Labor Organization (ILO) methodology*)» [16]. Similar changes did not escape the educational sector: «Due to active hostilities and occupation the part of the Ukraine territory, the educational process has been disrupted, as well as established mechanisms for collecting educational statistical information» [17, p. 6]. The powerful challenge for Ukraine scientists is the combination of a high level of complexity with increased responsibility during the current fateful events. They have only one advantage – to witness and participate in these events.

The foreign and domestic scientists' works testify to the educational sector's important role in solving labor market problems. In current Ukrainian realities, martial law circumstances are added to the well-known difficulties of this issue. Therefore, to carry out this research, a certain modification of the methodological toolkit is necessary.

Methodology and Data issues.

Theoretical origins. In general, the labor market is a mechanism for achieving the natural unemployment rate in a developing economy. This mechanism alleviates the market imbalance caused by technological progress in production and growth in consumption needs. Its action achieves certain proportions between the number of vacant jobs and applicants for these jobs. In active hostilities conditions, this mechanism is destroyed. Conducting a labor market comparative analysis in pre-war and wartime conditions is extremely problematic,

but its implementation is necessary to identify: those certain dependencies that have remained unchanged, as well as the directions and extent of corresponding changes.

The proposed generalizations and conclusions of this study should be considered taking into account the indicated circumstances. They are based on the assumption that martial law equally affected the reliability of the official statistics of the State Employment Service, which adheres to certain accounting standards [18]. The changes chronology is studied according to the relevant official statistical data at the end of the study periods – the months of 2021–2022 [16].

This study's *methodological approach* is based on the principle «from the opposite». This approach's objective is to identify education signs as a labor market subject. For this purpose, education is studied as an object of the Ukrainian labor market. Statistical methods are used: correlation analysis and diversified cross-industry comparisons of the labor market of Ukraine. The results interpretation and theoretical generalizations of changes in macroeconomic indicators are based on a structural-dynamic analysis.

Results. In 2022, the Ukrainian labor market experienced a powerful turbulent impact. It went through states from pre-war (January–February) through shock caused by unexpected military aggression (March–April), to adaptation and a certain stabilization (from May to the present time). By the January 2022 end, compared to the January 2021 end, the number of registered unemployed (below – unemployed) decreased by 54.74%, and the number of registered vacancies

(below – vacancies) – by 3.41%. The relative decrease in the unemployed number was greater than the relative decrease in the vacancies number by 50.33 pp. (Fig. 1).

The Ukraine labor market reacted to the military intervention as follows: at the December 2022 end, compared to the December 2021 end, the unemployed number decreased by 36.77%, and the vacancies number decreased by 48.24%. The relative decrease in the unemployed number was already smaller than the relative decrease in the vacancies number by 11.47 pp. In general, in 2021 and 2022, the reduction in the unemployed number is almost synchronous (correlation coefficient is 0.69), and there is no such synchronicity in changes in the vacancies number (correlation coefficient is -0.15). A detailed monthly analysis of the unemployed number in 2022 shows that if on the war eve (January–February), the unemployed number was more than 300,000, then in the next period (March–April) it decreased by almost 30,000 persons. The increase in the unemployed number

in May–June with the trend repetition of the pre-war period in the following months may be caused by the forced migrant's return from abroad and their desire for employment.

In the martial law first months (March–April), the number of vacancies decreased by almost 50%. After a slight recovery in August–November, at the December end, this indicator decreased by another 10%. During 2022, the educator's labor market indicators also decreased. But the nature of these changes dynamics in 2022, as well as in 2021, is fundamentally different from changes in the general labor market (Fig. 2). Changes in the unemployed number in the Ukraine labor market generally show a decreasing character (Fig. 1), but in the educator labor market, they occur in an unchanged positive annual cycle. The largest number of unemployed educators number in 2022 (June) was 10.8% less than the largest number in 2021 (July). At the same time, despite certain quantitative differences, the annual changes in this indicator remained almost synchronous

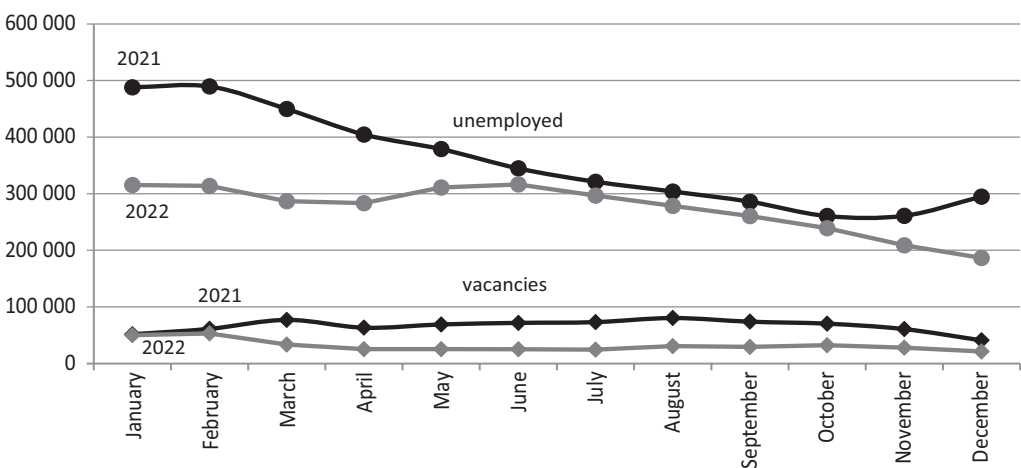


Fig. 1. Dynamics of the labor market in Ukraine, 2021–2022, persons

Compiled by the authors according to the data [16].

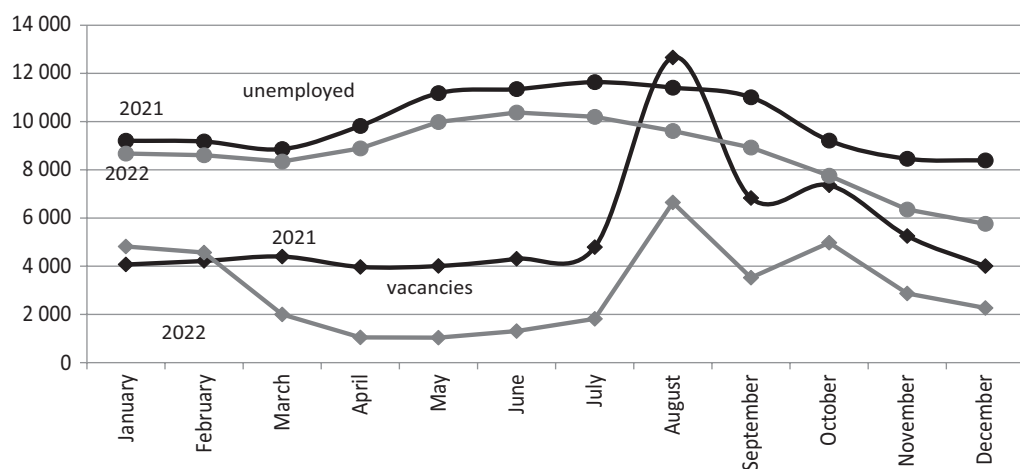


Fig. 2. Dynamics of the Education labor market in Ukraine, 2021-2022, persons
Compiled by the authors according to the data [16].

(correlation coefficient is 0.88). During the martial law period, there is a relationship strengthening between changes in the number of unemployed educators and the total unemployed number, with correlation coefficients: -0.17 in 2021 and 0.86 in 2022.

In 2021, the amplitude of fluctuations in the vacancies total number was almost 2.0 times (between the highest indicator in August and the lowest in December), and in 2022 it was almost 2.2 times (between indicators in February and July). Instead, the amplitude of fluctuations in the vacancies number in the education sector was more powerful both in pre-war 2021 – this indicator was 3.2 times (April–August), and in the war 2022 – 6.4 times (May–August).

The opposite nature and difference in the fluctuations amplitude power in the vacancies number for educators had a positive effect on the general job market:

- in July–August 2021, the total number of vacancies increased by 7,277, in education – by 7,872;

- in July–August 2022, the total number of vacancies increased by 6,304, in education – by 4,831.

The vacancies number in education in 2022 changed almost the same as in 2021 (correlation coefficient is 0.73).

At the same time, the similarity between changes in the number of vacancies in education and the entire Ukrainian labor market remained almost unchanged (correlation coefficient was 0.52 in 2021 and 0.57 in 2022). This means that the situation improved in the general labor market in August compared to July throughout both 2021 and 2022 was under the growing demand influence for educators.

During 2022, the structure of the number of unemployed (Fig. 3) and vacancies (Fig. 4) by economic activity types in the Ukraine labor market have changed significantly.

According to the unemployed number (Fig. 3), the leaders ranking positions among 19 economic activity types in January–December 2022 changed as follows:

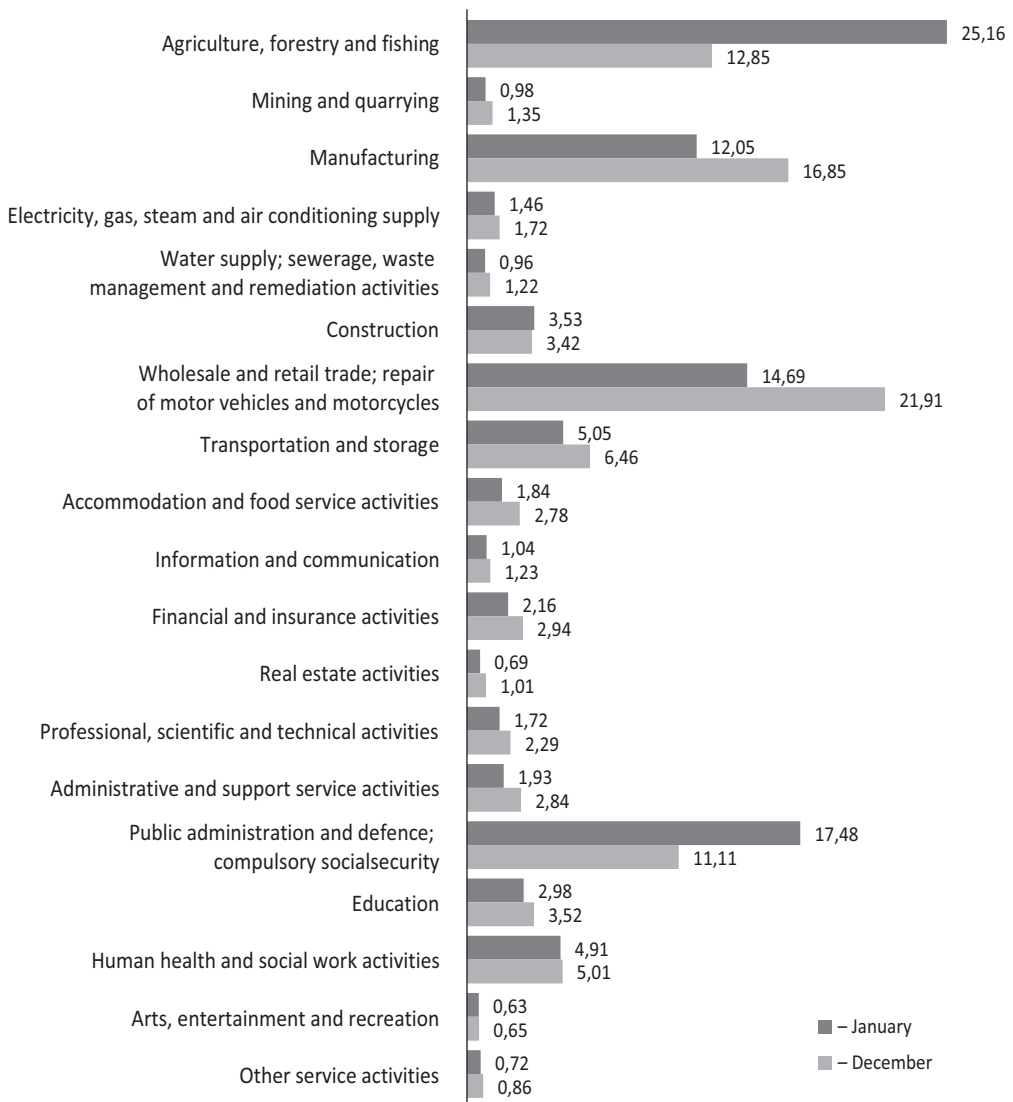


Fig. 3. The unemployed structure by economic activity types in Ukraine, 2022, at the end of the study periods, %

Developed by the authors according to the data [16].

- «Agriculture, forestry and fisheries» moved from 1st position to 3rd;
- «Wholesale and retail trade; repair of motor vehicles and motorcycles» moved from 3rd position to 1st position;
- «Manufacturing» was less than 1% ahead of «Public administration and defense; compulsory social security» on 2nd position.

«Education» with an increase in the share of the unemployed from 2.98 to 3.52% (by 0.54 pp) moved from 8th to 7th position.

According to the vacancies number (Fig. 4), the leadership rating positions of the economic activity types during this period almost did not change:

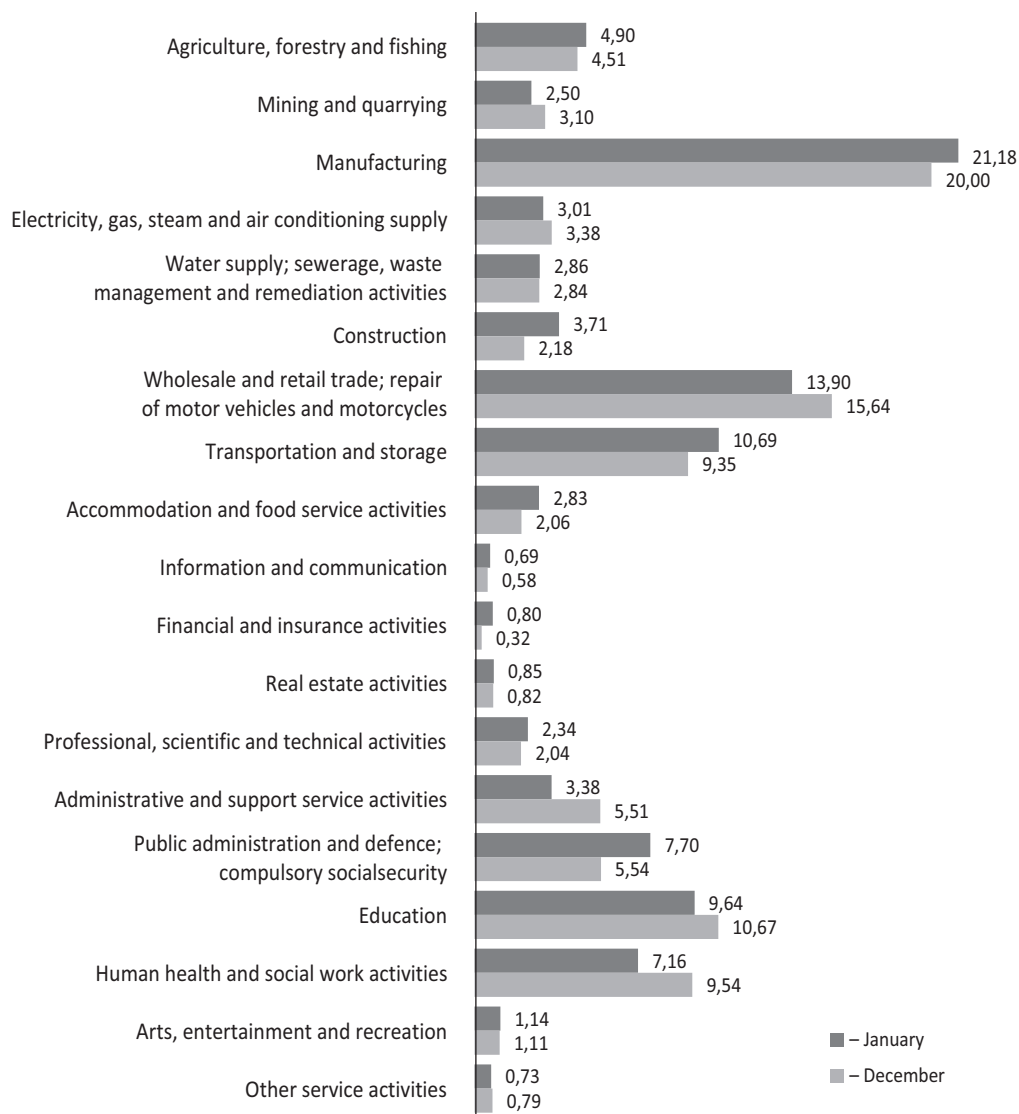


Fig. 4. The vacancies structure by economic activity types in Ukraine, 2022, at the end of the study periods, %

Developed by the authors according to the data [16].

- «Manufacturing» remained in the 1st position;
- «Wholesale and retail trade; repair of motor vehicles and motorcycles» remained in the 2nd position;
- «Education» replaced «Transportation and storage» on 3rd position.

At the end of the period, the share of education in the structure of vacancies was 10.67%.

During 2022, the *loading* (the contenders' number) per 1 vacancy in the Ukraine labor market changed from 6.3 to 8.8 persons, 2.5 persons increase, or 39.68%. Among the 19 economic

activity types (Fig. 5), its decrease is observed only in «Agriculture, forestry, and fisheries» (by 1.36 times). It grew most significantly in «Financial and insurance activities», in «Construction» and «Information and communication». The least significant – in «Human health and social work activities», in

«Public administration and defence; compulsory social security» and in «Other service activities». During the 2022 war period, the loading per 1 vacancy in Education almost doubled, by 41.11%, this led to its shift from 10th to 3rd place among other economic activity types.

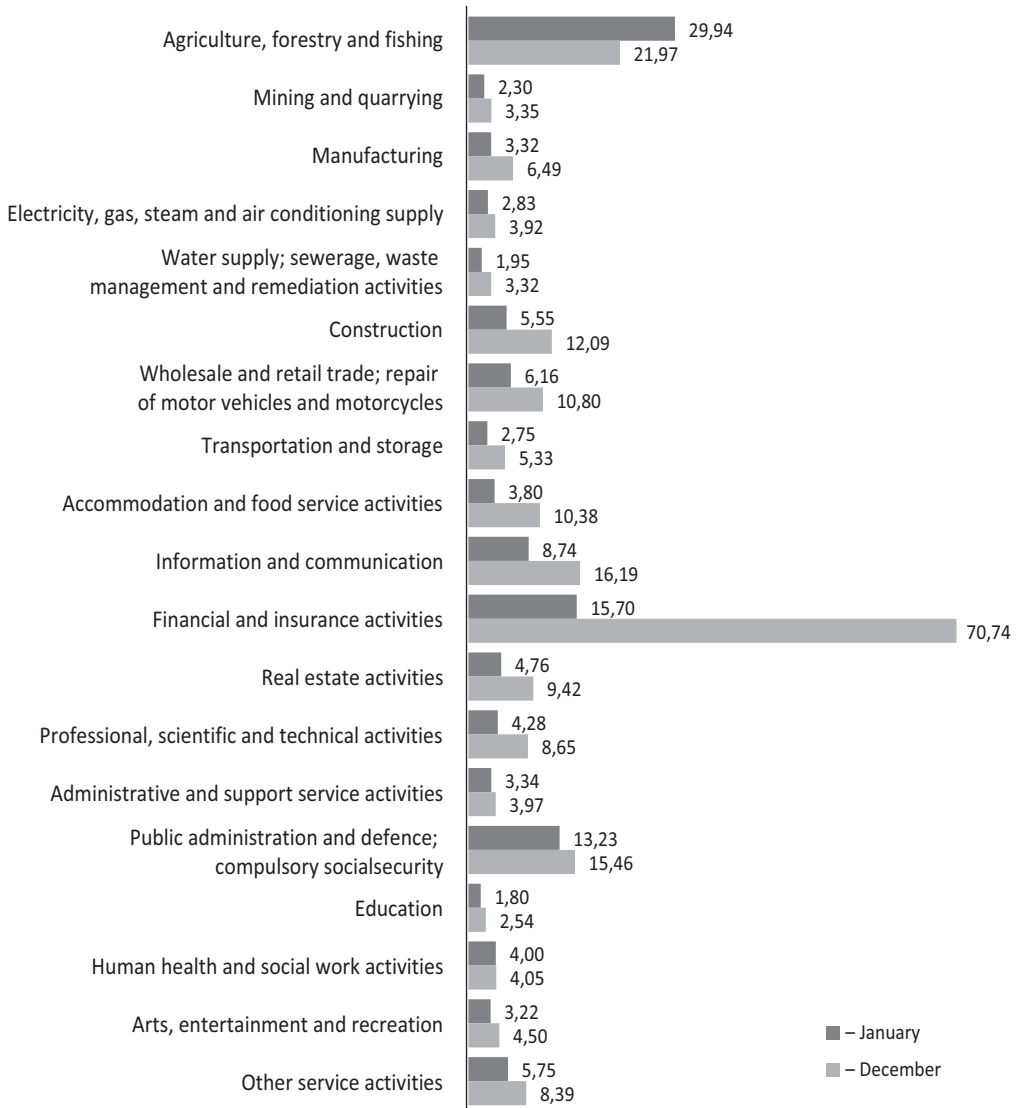


Fig. 5. Loading per 1 vacancy by economic activity types in Ukraine, 2022, at the end of the study periods, persons

Developed by the authors according to the data [16].

An increase in loading per 1 vacancy means a decrease in the opportunity to get a job for the unemployed. A change analysis in the unemployed and vacancies proportions by economic activity types gives an idea about such a decrease degree (table).

First of all, it should be noted the differences in the changes in these proportions in *the Ukraine labor market as a whole*. During 2021, the unemployed number decreased by almost 40%

and vacancies – by almost 21%. The outpacing decrease in the unemployed number compared to the vacancies number can be considered a supply and demand labor market matching consequence. The positive effect is that such changes mean an improvement in the market situation – the almost 2-fold decrease in loading per 1 vacancy. What were the mechanisms and how perfect was this improvement is a matter for a separate study.

Table

The unemployed and vacancies proportions by economic activity types in Ukraine, 2022, at the end of the study periods

Types of economic activity	January		December	
	The difference: unemployed-vacancies, persons	The share of the unemployed without job vacancies, %	The difference: unemployed-vacancies, persons	The share of the unemployed without job vacancies, %
Total	265 418	84,15	165 267	88,61
Agriculture, forestry and fishing	70 846	96,66	20 094	95,45
Mining and quarrying	1 620	56,51	1 548	70,17
Manufacturing	24 512	69,84	23 347	84,60
Electricity, gas, steam and air conditioning supply	2 757	64,69	2 097	74,47
Water supply; sewerage, waste management and remediation activities	1 357	48,71	1 400	69,90
Construction	8 429	81,98	5 136	91,73
Wholesale and retail trade; repair of motor vehicles and motorcycles	35 859	83,77	32 578	90,74
Transportation and storage	9 367	63,67	8 593	81,23
Accommodation and food service activities	3 957	73,67	4 110	90,37
Information and communication	2 679	88,56	1 884	93,82
Financial and insurance activities	5 896	93,63	4 742	98,59
Real estate activities	1 594	78,99	1 473	89,38
Professional, scientific and technical activities	3 839	76,66	3 318	88,43
Administrative and support service activities	3 949	70,07	3 479	74,83
Public administration and defense; compulsory social security	47 069	92,44	17 017	93,53
Education	3 858	44,48	3 493	60,64
Human health and social work activities	10 719	74,97	6 189	75,34
Arts, entertainment and recreation	1 263	68,98	822	77,77
Other service activities	1 739	82,61	1 242	88,09

Calculated by the authors according to the data [16].

In our study, it should be noted that during 2022 these changes were the opposite. If the decrease in the unemployed number almost repeated last year's indicator – 41%, then the decrease in the vacancies number significantly exceeded it – 57.5%. The rapid acceleration in the decrease rate of the jobs (vacancies) supply is due to military aggression. It means the labor market degradation, which is accompanied by a decrease in the employment possibility in the Ukraine labor market general from 15.85% to 11.39%.

Unsatisfactory employment opportunities remain in the following economic activity types that are strategic for economic development, such as:

- «Financial and insurance activities» (1.41%),
- «Information and communication» (6.18%),
- «Public administration and defense; compulsory social security» (6.47%).

The employment opportunities have slightly increased only in «Agriculture, forestry, and fisheries» (up to 4.55%).

The differences in the education labor market already found in the above analysis are also present in changes in the unemployed and vacancies proportions. The following economic activity types suffered the greatest losses in employment opportunities throughout 2022:

- «Water supply; sewerage, waste management and remediation activities»: from 51.29% to 30.10%,
- «Transportation and storage»: from 36.33% to 18.77%,
- «Education»: from 55.52% to 39.36%.

Despite losses of vacancies in the Ukraine labor market during martial

law, the educational sector continues to demonstrate relatively better positions: almost 40% of unemployed educators have vacancies.

Conclusion. The study revealed a generally high degree of labor market dynamics in Ukraine and the negative changes that were caused by martial law. Throughout 2022, the number of unemployed and vacancies decreases, but after April they change in different ways. The unemployed number, in contrast to the vacancies number, shows a temporary upward trend.

In 2022, the educational sector positions in the Ukraine labor market are relatively strengthening. There is a closer relationship with changes in the unemployed number, as well as a direct positive effect of the vacancies number for educators on the general indicators. By the structural and dynamic analysis of the Ukraine labor market indicators by economic activity types, education shows priority positions according to the load indicator for 1 vacancy and the positive dynamic of its proportions.

The study results provide grounds for the conclusion about certain relatively stable dependencies and advantages of the educational sector in the Ukraine labor market. They do not reveal the mechanisms of these dependencies' action and the emergence of these advantages. But this does not prevent us from making assumptions that the educational sector features have a natural nature and outlining ways to use them in the entire labor market favor.

The *first goal orientation* of such use is the provision of those qualifications that are necessary to fill vacancies in other economic activity types. By the 2023 beginning, more than 21,000 such vacancies have been registered.

The *second goal orientation* is the provision by the educational sector of those qualifications that are necessary for new job creation (vacancies) in all economic activity types. After all, assuming all available vacancies are filled by the 2023 beginning, more than 165,000 persons (88.6%) will remain without employment opportunities. The overwhelming majority of this economically active population (86.3%) previously worked and received unemployed status within a year after leaving their last job. This condition is largely due to the knowledge lack among the unemployed, without which they are not able to use their own productive potential.

Achieving *these goal orientations* is impossible without appropriate scientific and methodological processing and institutional reinforcement. The State Employment Service, which uses education as an auxiliary tool for career guidance and retraining of the already registered unemployed, shows signs of the *first goal orientation*. In this way, the powerful potential of education is only partially used. It does not take into account and does not use the stable structural and dynamic properties of the educational sector in the Ukraine labor market.

Signs of the *second goal orientation* are contained in the «Concept of the State Targeted Social Program for the Development of Vocational (Vocational and Technical) Education for 2022-2027» [19]. The solution to urgent problems in the education sector, formulated in this concept, is actually aimed at meeting the current and future needs of the Ukrainian labor market.

Prospective aspects of research

The study results give reasons to

consider the educational sector's potential as a source of the Ukrainian labor market revitalization. Martial law necessitates a quick response to today's economic challenges. The shortest way to master the necessary practical knowledge is through obtaining vocational and technical education. It takes 1.5 years to train young people with a complete secondary education, and several months for adults with industrial experience.

Previous studies allow us to state that in Ukraine there are economic prerequisites for the introduction of public-private partnership (PPP) in the vocational education field [20]. Foreign experience processing indicates the prospects of scientific research in this direction [21]. At the same time, it should be taken into account that the initial conditions of such studies in Ukraine differ significantly from their world analogs.

Assistance to entrepreneurial potential to carry out social projects is widespread abroad. Instead, the primary problem in Ukraine is the creation of such potential. Scientifically balanced decisions are needed to fill the Ukraine labor market with such professional entrepreneurs who can provide an economic foundation for resisting the aggressor. In the short term, the national economy will require post-war reconstruction, new economic infrastructure and new production capacities.

Addressing this complex issue requires finding ways to establish public-private partnerships to provide and use relevant knowledge. In such a partnership, the private interests of acquiring knowledge to create new jobs and obtaining entrepreneurial profits are harmonized with the public

interests of providing education to ensure economic development.

The problematic issue is the coordination of these interests and the transition from declarative statements to specific decisions on the mechanisms for implementing such a partnership.

The path to concretization passes through the scientific development of the methodology for determining the expected socio-economic effect of public-private partnerships in field of vocational (vocational and technical) education.

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ОСВІТА ЯК СУБ'ЄКТ РИНКУ ПРАЦІ УКРАЇНИ В ПЕРІОД ВОЄННОГО СТАНУ

Анотація. Спонукальним мотивом дослідження є пошук шляхів використання унікальної функціональної властивості освіти – надання тих знань і вмінь, без яких не можливе функціонування всіх галузей національної економіки. Метою цього дослідження є виявлення ознак, передумов та перспективних напрямів розвитку освітньої галузі як одного з визначальних суб'єктів ринку праці України. У методологічному підході «від протилежного» застосовано методи багаторівневого порівняльного аналізу. Для виявлення характерних ознак освітньої галузі проаналізовано річні структурно-динамічні зміни ринку праці України в мирний і воєнний періоди. В умовах воєнного стану попит та пропозиція на вітчизняному ринку праці скоротилися майже вдвічі, посилюється ринковий дисбаланс. Разом із тим виявлені за результатами дослідження властивості освітньої галузі України дали підстави запропонувати напрями й форму активізації освіти як каталізатора відновлення та розвитку національної економіки. Розглядаються дві основні ідеї як настанови посилення вітчизняного ринку праці. Настановою сьогодення є забезпечення безробітних знаннями й уміннями, потрібними для заповнення наявних вакансій; настановою на перспективу – використання потенціалу освіти для створення нових робочих місць. Формою реалізації цих настанов є диверсифікація освіти у формі навчально-кваліфікаційних комплексів (у першу чергу у сфері професійної освіти) на засадах державно-приватного партнерства. За такого підходу освіта як суб'єкт ринку праці України стає каталізатором запровадження державно-приватного партнерства в інших секторах економіки.

Ключові слова: безробіття, воєнний стан, зайнятість, освіта, ринок праці, суб'єкт ринку праці, настанова.

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